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Psychiatric Comorbidity in Essential Hypertension

(Pattern, Prevalence of Psychiatric Comorbidity and Quality of Life in Subjects with Essential Hypertension)

Aborlo Kennedy Nkporbu and
Princewill Chukwuemeka Stanley

Additional information is available at the end of the chapter

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Abstract

The prevalence of essential hypertension has continued to increase worldwide, and its consequences have remained a growing concern. A number of sociodemographic and clinical variables may however serve as key determinants of the extent to which it is associated with psychiatric comorbidity as well as impairment of quality of life. The aim of this study, therefore, was to determine the sociodemographic and clinical factors that may influence the level of psychiatric comorbidity and quality of life associated with persons with essential hypertension attending the general outpatient clinic of the University of Port Harcourt Teaching Hospital (UPTH). Following ethical approval and informed consent from the participants, 360 subjects making up the study group were recruited based on the study's inclusion and exclusion criteria. A pilot study was carried out. Subjects were further administered with the study's instruments including the socio-demographic/clinical questionnaire, GHQ-12, WHO Composite International Diagnostic Interview (WHOCIDI) and the WHOQOL-Bref. The data were analysed using the Statistical Package for Social Sciences version 16 statistical package. Confidence interval was set at 95%, while p-value of less than 0.05 was considered statistically significant. The study found a prevalence of psychiatric comorbidity of 64.4% among the hypertensives. Among the study group, there was no significant relationship between the presence of psychiatric comorbidity and age class ($p = 0.350$), gender ($p = 0.22$), level of education ($p = 0.43$), income class ($p = 0.81$) and occupation. Persons who were married were significantly more likely to have a psychiatric comorbidity ($p = 0.001$). There was also no significant relationships between age of onset of illness ($p = 0.60$), duration of illness ($p = 0.73$), duration of treatment ($p = 0.82$) and self-stigma ($p = 0.15$). The findings of this study support the impression that essential hypertension is a chronic debilitating illness, associated with psychiatric comorbidity and reduced quality of life, that is largely significantly influenced by a number of sociodemographic and clinical factors. The results support the call that the management of patients with

essential hypertension should include attention to the mental health status of the sufferers.

Keywords: pattern and prevalence, essential hypertension, psychiatric comorbidity, QOL, UPTH

1. Introduction

There is a growing population of persons with essential hypertension (HT) worldwide despite all efforts at increasing education and awareness about it [1–19]. World Health Organization (WHO) estimates that non-communicable diseases like hypertension and other heart diseases, stroke, depression and cancers will increase by 60% by 2020 and are likely to triple in Nigeria and other sub-Saharan African countries in the next 50 years. According to the World Health Report, non-communicable diseases including diabetes mellitus, arthritis and cardiovascular diseases make up to about 22% of all deaths in the region in the year 2000; cardiovascular diseases alone accounted for 9.2% of the total deaths [20]. Indeed, it has already been projected that up to three quarters of the world's hypertensive population will be in economically developing countries by the year 2025 [7]. With increased prevalence rates and the resultant greater economic and health burden [8–10], nations like China and Nigeria will feel the impact mostly due to their population size.

Hypertension constitutes a greater percentage of all the referrals from other nonpsychiatric units seeking for psychiatric evaluation in the University of Port Harcourt Teaching Hospital (UPTH) [21]. Essential hypertension runs the features of chronicity, with subsequent need for long-term medications, adverse effects on the central nervous system (CNS), high rate of mortality and morbidity [10, 22, 23] and impact on emotion [24, 25] (the component that is often neglected). In addition, patients with hypertension need extensive education, attitudinal change, coping and healthy lifestyle, including diet and exercise. The need for these adjustments is imperative considering the immediate changes that usually accompany the diagnosis of the condition. They include burden of the diseases, regular hospital visits, complications arising from the primary illness and job adjustment. For these reasons, together with their direct effects on the central nervous system (CNS), no doubt, the patients commonly present with varying degrees of psychopathology [26–30]. Psychopathology is the inward or outward manifestation of a disordered psychic system.

Essential hypertension is a severe, chronic systemic disease and is becoming increasingly associated with psychiatric comorbidity, as high as 30–60% at present [31–36]. It carries enormous burden on both the patients and the caregivers [37, 8–10]. Unfortunately, there appears to be a general under-recognition or late recognition of, and in some cases poor attention to, the psychiatric component by clinicians [38–42] particularly in this environment [43]. This is often accompanied by increased severity and clinical deterioration of these illnesses, poor management and prognosis with eventual high mortality rates. Late recognition of mental disorders in hypertensive patients is related, among others, with diminished coping

capacity at diagnosis, failure at primary prevention, poor antihypertensive adherence [44–47], impairment in quality of life (QOL) [48–56], greater social burden, overall increases in healthcare costs [57–59], and also higher mortality [8]. Also, psychological distress and lifestyle variables among patients with hypertension are equally associated with noncompliance.

To further compound the problem is the co-existence of other medical conditions like diabetes and obesity, with hypertension. Their presence further worsens the clinical outlook, complicates treatment and causes noncompliance [60]. Hypertension can, either singly or in association with other adverse psychosocial and clinical factors, predispose to psychiatric disorders. Furthermore, some of the medications employed in the management of these conditions have been associated with inherent neuropsychiatric complications [61, 62] either as direct side effects, from drug interactions with psychoactive substances, from multiple drug therapy or with other concomitantly administered drugs for other comorbid conditions.

Apart from the above aetiological links, a common pathway—sympathetic pathway [63–66]—seems to mediate both essential hypertension and most anxiety disorders. It is equally important to note that baseline adverse psychosocial factors, psychological distress or clearly identified psychiatric conditions have been implicated as predictors of hypertension [67–72]. In light of the foregoing, there appears to be a bidirectional relationship between associated psychiatric disorders and hypertension. This propensity to be associated with emotional disturbances, with tendency to either predispose to or comorbid with psychiatric disorders, has further increased the degree to which they affect the psychological well-being and quality of life of the sufferers [73–80]. The focus of medical practice has always tended towards relieving physical symptoms, in this case hypertension, which often neglects the huge impact on the psychological well-being, psychiatric comorbidity and the overall quality of life of the sufferers, often occasioning monumental health consequences [81, 82].

A prompt multidisciplinary approach involving evaluation, counselling and treatment of mental disorders in hypertensive patients is becoming more important [83]. Therefore, the determination of the nature and magnitude of psychiatric comorbidity, the additive effects on psychological well-being and quality of life and emphasis on the need for mental health component in the management of essential hypertension and other chronic medical conditions form the areas of concern of this study.

2. Overview of hypertension

Hypertension is defined as a persistent elevation in blood pressure (BP) over an acceptable upper limit of normal values of systolic and diastolic blood pressures [84]. Objectively, hypertension is blood pressure persistently equal to or greater than 140/90 mmHg [85]. The systolic pressure is the pressure at the peak of the heart's contraction, while diastolic blood pressure is the pressure when the heart relaxes. Blood pressure varies from moment to moment and has a diurnal variation, being highest at 10 am and lowest at 3 am [86]. Hypertension may be of unknown cause called essential hypertension or hyperpiesia [87] or may have an underlying cause when it is known as secondary hypertension. Hypertension has been

classified by the World Health Organization/International Society of Hypertension into mild, moderate, severe and high normal [83].

Hypertension is a non-communicable chronic disease, often requiring long-term treatment. The incidence may be on the increase as a result of increasing urbanisation and changing lifestyles in the world [88–92]. Hypertension is regarded a major public health problem [29], and it is an important threat to the health of adults in sub-Saharan Africa [93, 94].

Secondary hypertension indicates that the high blood pressure (HBP) is a result of another underlying condition, such as kidney disease or tumours (adrenal adenoma or phaeochromocytoma). The pathogenesis of essential hypertension is not clearly understood [95, 96]. However, different investigators have proposed the kidney, peripheral resistance vessels and the sympathetic nervous system as the seat of the primary abnormality [97]. In reality, the problem is probably multifactorial. On the other hand, most mechanisms leading to secondary hypertension are well understood [97]. Some studies have tried to implicate genetic and environmental aetiologies to hypertension [98–101]. Disorder of the autonomic system, as in the case of sympathetic nervous system overactivity and others include imbalance in the renin-angiotensin-aldosterone system, chronic exposure to stress, chronic use of alcohol and other associated medical diseases like diabetes.

3. Epidemiology of hypertension

The prevalence of hypertension is probably on the increase in developing countries, including Nigeria, where adoption of western lifestyles and the stress of urbanisation, both of which are expected to increase the morbidity associated with unhealthy lifestyles, are not on the decline [102, 103]. The prevalence of hypertension depends on both racial composition of the population of the study and the criteria for defining the condition [104]. In Nigeria, it is the commonest non-communicable disease; over 4.3 million Nigerians above the age of 15 years are classified as being hypertensives [105, 106].

Risk factors have equally become important in the aetiology of hypertension. A study found that as high as 62% of the total population of hypertensive lived with at least two risk factors, mainly diabetes mellitus and alcohol use. Several other studies both in Nigeria and elsewhere have also implicated diabetes, calcium salt and fat intake from consumption of processed food [91], participating in jobs with minimal activities, obesity [92], consumption of caffeine [89, 108, 109] and alcohol [107], smoking and hypercholesterolemia [110, 111]. A proportion of the diabetic population (20%) suffered from isolated systolic hypertension [106]. In a meta-analysis of nine studies carried out in Nigeria with similar methodology, the authors [93, 112–115] summarised the prevalence of hypertension in population of Nigeria for a 20-year period (1990–2009), in which two reviewers, independently, were used during the selection process, so as to reduce bias as much as possible.

In spite of the peculiarities found in studies on hypertension in different parts of the world, it is important to note that in all areas, hypertension (HT) or high blood pressure (HBP) is a heterogeneous set of disorders. Social and cultural factors have a direct aetiological effect on

hypertension, and these factors are responsible for most of the differences in disease prevalence in different parts of the world. High blood pressure is a mass phenomenon responsible for high morbidity and mortality affecting millions of people the world over [30], and with the notable exception of a few non-salt-eating primitive societies, it occurs everywhere. Diseases of the cardiovascular system are among the most important causes of morbidity in the industrialised world [30, 116, 117], accounting for over one-third of all deaths in the United States [118, 119]. A study [7] estimates a worldwide prevalence of between 10 and 15% of adult populations to have high blood pressure which also agrees with findings in Africa [120]. However, other studies have reported a worldwide prevalence of 15–30% in adults [121]. Studies from the Western world identified five factors associated with hypertension: increasing age, obesity, elevated pressure in blood relative, environment and race [116].

4. Hypertension and psychopathology

The relationship between hypertension and emotional disturbance or psychiatric morbidity could be described as bidirectional, or better still, as taking the form of a vicious cycle. Apart from the genetic components, persistent environmental stressors are well-known triggers for hypertension [25, 31, 122]. They reset and over amplify the sympathetic outflow [62–65, 123]. The neurotransmitter that fuels the sympathetic pathway, noradrenaline, is consequently overelaborated and becomes hyperactive. This causes both hypertension and anxiety disorders including generalised anxiety disorder (GAD), panic disorder, acute stress disorder and PTSD. On the other hand, the presence of anxiety alone can cause hypertension in predisposed individuals [49, 50]. The chronicity of hypertension, persistent and recurrent symptoms, impairment in functioning capacity, other adverse and enduring environmental psychosocial burdens and even the thought of these can also in turn cause anxiety and may also quickly drive the patient into depression, suicidal ideation or attempt and ultimately suicide. Long-standing untreated depression in hypertensive patients can be complicated with psychosis [23]. Also, hypertension can be complicated with cerebrovascular accident (CVA), with its attendant neuropsychiatric sequelae including depression, anxiety, mild-to-severe cognitive impairment, personality changes, vascular dementia and psychosis.

Lishman identified the interest of psychiatry in hypertension, besides the obvious consequences of its central nervous system effects and noted:

1. The intriguing possibility of psychological factors as a part causation of essential hypertension.
2. Symptoms of hypertension like headache, fatigue, etc. appear to arise secondarily from knowledge of the disorder than increased blood pressure per se.
3. Iatrogenic psychiatric effects can figure prominently in the use of antihypertensive drugs.

He suggested possible explanations including drugs taken, feeling ill and attendance to hospital per se and possibly more pre-morbidly neurotic individuals becoming hypertensive patients. Other various writers have also looked in depth at purely psychological attributes in

hypertensive subjects either causally or effectually [106, 124]. Fundamental advances in the understanding of hypertension from then have coincided with theories of anxiety states and affective disorders suggesting catecholamines as mediators. These find common ground in suggested mechanisms for producing increased arterial pressure [62–65, 123].

Studies have shown that stress-related situations, issue of job loss and unemployment [24], prolonged difficulties, being under stress and people at war front were shown to have elevated blood pressures [25, 31, 122]. It has been found that stress increases the level of cortisol which causes increased deposition of arteriosclerotic deposits in the intima of blood vessels. These depositions gradually narrow the lumen of the vessels, which in turn increases arterial pressure resulting into hypertension. The same elevated cortisol has been implicated in depression and also explains the high rate of depression associated with disorders that primarily involve cortisol-like Cushing's syndrome [125, 126]. It has also been suggested that hypertensive individuals exhibit more aggressive traits than others and that these may be hidden or suppressed, becoming manifest by abnormal elevation of blood pressure [127].

Psychosocial stressors, especially job-related stressors, predicted hypertension more strongly in men than in women in these data as in those of other investigators [50]. Other potential hypertension risk factors included social alienation and low level of education and ethnicity, which are independent predictors of hypertension. Indicators of subjective distress and low educational status, on the other hand, appeared more predictive of hypertension in women than in men. The excess impact of psychosocial stress on the development of hypertension in men compared with women may be related to sex differences in reactions to cardiovascular stress reactivity [127].

Some other studies that have examined the association of hypertension with psychological distress, such as anxiety and depressive symptoms, have produced mixed findings. Several studies have reported positive associations [128, 129], whereas others have observed weak or no associations. Other numerous studies have produced evidence that patients with depression have an increased risk of developing cardiovascular disease [48]. Also, depression in untreated hypertension might increase risk of developing cardiovascular disease. There is even some evidence to suggest lower blood pressure (BP) in participants with depressive or anxiety disorders. These areas of uncertainty call for further research (longitudinal) to evaluate the true associations between mental disorders and hypertension.

The findings of other studies that depressive disorder was associated with lower systolic blood pressure (SBP), although the use of tricyclic antidepressants was associated with greater risk of hypertension, may simply correspond with increased risk of weight gain associated with these agents [130]. Similar findings have been made with psychotropic medications. These studies are limited by their cross-sectional design, which made it difficult to infer causality or determine the direction of the observed relationship between hypertension and psychological distress. A related issue is the effect of labelling patients as hypertensive. Several studies have suggested that individuals 'labelled' as hypertensive might adopt a sick role that can negatively affect quality of life [74–79]. For this reason, the association between hypertension and psychological distress may be because of a direct effect of the BP itself, adverse effects of treatment or the consequences of labelling.

Another study also found that health-related quality of life, including physical functioning, vitality, mental health and pain thresholds, was better in unaware compared with aware hypertensive participants [78]. Several mechanisms have been postulated to explain the effects of labelling. Some evidence suggests that the act of labelling somebody as hypertensive can cause increases in sympathetic activity during mental stress [123], which might partly explain the reason for the poor mental health of patients with hypertension. In a study of 214 normotensive and mildly hypertensive participants, the perception of being hypertensive was associated with greater anxiety during clinic BP measurement and may be due to the white coat effect [131].

Another study also observed direct associations between the use of alcohol (daily >14 g intake of ethanol) and kola nut consumption in men and isolated systolic hypertension [124]. The survey showed that over 10% of the population taking kola nuts (at least one in 2 days) and/or alcohol is hypertensive. Caffeine has been identified as a significant cause of hypertension [79]. The authors [79] therefore concluded that programmes to improve treatment of hypertension should not only focus on lifestyle variables like smoking and alcohol, but they should also include the identification and treatment of substance abuse and dependence disorders.

Besides anxiety and depression, a range of other psychiatric problems may occur following cerebrovascular accident resulting from hypertension. They include cognitive disorders and personality changes [127], especially with the involvement of the right hemisphere. In fact, untreated hypertension can equally cause cognitive impairment, which is commonly seen in organic psychiatry [97]. A study done in two communities in Ibadan metropolis, Nigeria, by Ogunniyi and Baiyewu found a high rate of incident (vascular) dementia with psychological and behavioural components as complications of hypertension [43]. Studies have also found out the association between hypertension and erectile dysfunction in men. A study noted 1% of psychogenic impotence and 1% secondary to the effect of some antihypertensive drugs like methyl dopa and reserpine [29].

This study was therefore designed to evaluate the sociodemographic and clinical correlates of psychiatric comorbidity in hypertensive patients. This, no doubt, would be of immense relevance to the practice of consultation liaison psychiatry in the West African subregion and contribute to the corpus of knowledge on chronic medical conditions and aid care/service providers to plan better management strategies that will also accord premium to the psychological component and well-being of these patients. Impairments, disabilities and handicaps from chronic conditions may thus be limited and patients' dignity and functional capacity enhanced.

5. Aim

The study was to determine the pattern and prevalence of psychiatric comorbidity and quality of life in subjects with essential hypertension.

6. Methodology

In this cross-sectional study, following ethical approval from the hospital and informed consent from the participants, 360 subjects making up the study group were recruited based on the study's inclusion and exclusion criteria, after a pilot study for both groups. In addition, the hypertensives were screened for human immunodeficiency virus (HIV) infection. Subjects were further administered with the study's instruments including the sociodemographic questionnaire, General Health Questionnaire, version 12 (GHQ-12), World Health Organization Composite International Diagnostic Interview (WHOCIDI) and the brief version of the WHO Quality of Life (WHOQOL-Bref) instrument. Severity of hypertension was determined using the modern classification by the WHO/International Society of Hypertension into mild, moderate and severe. Those considered suitable for the study were patients who had been seen and diagnosed as having essential hypertension by the consultant family physicians and internists.

The hypertensive patients have all had basic investigations: i.e. full blood count, blood urea and electrolytes estimation and urinalysis, in most cases. In addition, some had electrocardiograms (ECG), chest X-rays, serum cholesterol, uric acid, creatinine and creatinine clearance estimations. Investigation results were all recorded in the case notes. Hypertensive patients with primary myocardial or valvular disease, cardiac failure or renal failure or who had a stroke or coronary heart disease, diabetes, asthma or other chronic illnesses or those found to be acutely ill were excluded. Patients were required to have been diagnosed for at least the past 1 year and have had at least 6 months of treatments. The data were analysed using the Statistical Package for Social Sciences version 16 statistical package. Confidence interval was set at 95%, while p-value of less than 0.05 was considered statistically significant.

7. Study instruments

The following instruments were used in this study:

- Sociodemographic/clinical questionnaire
- General Health Questionnaire, version 12 (GHQ-12)
- World Health Organization Composite International Diagnostic Interview (WHOCIDI)

8. Results

8.1. Sociodemographic and clinical correlates of psychiatric morbidity in study group

Out of the 360 subjects with essential hypertension who fulfilled the inclusion criteria, 141 (39.2%) were males and 219 (60.8%) females. The mean age for the study group (hypertensives)

was 45.57 years. More than half of all the subjects 257 (71.4%) were married. The majority (78.0%) had attained at least a secondary level of education.

Variables	Essential hypertensive			Statistical analysis
	Total	Psychiatric diagnosis	No psychiatric diagnosis	
Age				$\chi^2 = 3.27$
<20	0	0 (0.0%)	0 (0.0%)	df = 4
20–29	16	9 (3.8%)	7 (5.6%)	p = 0.35
30–39	77	49 (20.8%)	28 (22.6%)	
40–49	132	82 (34.7%)	50 (40.3%)	
≥50	135	96 (40.7%)	39 (31.5%)	
	360	236 (65.6%)	124 (34.43%)	
Sex				$\chi^2 = 1.52$
Male	141	87 (36.9%)	54 (43.5%)	df = 1
Female	219	149 (63.1%)	70 (56.5%)	p = 0.22
Marital status				$\chi^2 = 20.94$
Married	257	153 (64.8%)	104 (83.9%)	df = 4
Single	38	25 (10.6)	13 (10.5%)	p < 0.001
Divorced	3	8 (1.30%)	0 (0.0%)	
Separated	8	8 (3.4%)	0 (0.0%)	
Widowed	54	47 (19.9%)	7 (5.6%)	
Education				$\chi^2 = 2.78$
None	17	10 (4.2%)	7 (5.6%)	df = 3
Primary	76	55 (23.3%)	21 (16.9%)	p = 0.43
Secondary	128	85 (36.0%)	43 (34.7%)	
Tertiary	139	86 (36.4)	53 (42.7%)	
Tribe				$\chi^2 = 0.43$
Hausa	7	3 (1%)	4 (1.1%)	df = 2
Ibo	75	41 (11.4%)	34 (9.4%)	p = 0.81
Yoruba	20	10 (2.8%)	10 (2.8%)	
Ijaw	83	52 (14.4%)	31 (8.6%)	
Ogoni	62	29 (8.1%)	33 (9.2%)	
Ikwerre	79	48 (13.3%)	31 (8.6%)	
Others	24	16 (4.4%)	8 (2.2%)	

Variables	Essential hypertensive			Statistical analysis
	Total	Psychiatric diagnosis	No psychiatric diagnosis	
Average monthly income				$\chi^2 = 23.86$
Low	83	54 (24.8%)	29 (24.2%)	df = 3
Average	159	104 (47.7%)	54 (45.0%)	p < 0.001
High	97	60 (27.5%)	37 (30.8%)	
Reaction to diagnosis				$\chi^2 = 14.41$
Normal	38	18 (7.6%)	20 (16.1%)	df = 10
Sad	175	101 (42.8%)	74 (59.7%)	p = 0.16
Very sad	146	116 (49.2%)	30 (24.2%)	
Wish to die	1	1 (0.4%)	0 (0.0%)	
Mode of getting drugs				$\chi^2 = 13.09$
From the government	106	42 (11.7%)	64 (17.8%)	df = 3
Self-purchase	202	146 (40.6%)	56 (15.6%)	p = 0.57
Both	52	35 (9.7%)	17 (4.7%)	
Source of support				$\chi^2 = 15.06$
Charity organisation	14	9 (2.5%)	5 (1.4%)	df = 3
Fiends	36	27 (7.5%)	9 (2.5%)	p = 0.33
Relatives	92	60 (16.7%)	32 (8.9%)	
None	218	143 (39.8%)	75 (20.8%)	
Domestic situation				$\chi^2 = 12.41$
Partner	37	22 (6.1%)	15 (4.2%)	df = 3
Family	307	213 (59.2%)	94 (26.1%)	p = 0.51
Friends	7	3 (0.8%)	4 (1.1%)	
None	9	5 (1.4%)	4 (1.1%)	
Blood pressure				$\chi^2 = 16.40$
BP within normal range	0	0 (0%)	0 (0%)	df = 3
Mild hypertension	119	49 (13.7%)	70 (19.4%)	p = 0.001
Moderate hypertension	161	114 (31.7%)	47 (13.1%)	
Severe hypertension	80	73 (20.3%)	7 (1.9%)	
Occupation				$\chi^2 = 17.63$
Managers	5	3 (1.3%)	2 (1.6%)	df = 10
Professionals	15	5 (2.0%)	10 (2.8%)	p = 0.82

Variables	Essential hypertensive			Statistical analysis
	Total	Psychiatric diagnosis	No psychiatric diagnosis	
Technicians and associate professionals	30	23 (7.7%)	7 (5.6%)	
Clerical support workers	46	32 (13.6%)	14 (11.3%)	
Service and sales workers	29	18 (7.6%)	11 (8.9%)	
Skilled agricultural forestry and fishery workers	30	23 (9.7%)	7 (5.6%)	
Craft and related trade workers	54	33 (13.6%)	22 (17.27%)	
Plant and machine operators and assemblers	47	31 (13.1%)	16 (12.9%)	
Elementary occupation	72	50 (21.2%)	22 (21.8%)	
Armed forces occupation	3	1 (0.4%)	2 (1.6%)	
Unemployed	22	17 (7.2%)	5 (4.0%)	
Age of onset of disease				$\chi^2 = 1.89$
20–29	27	18 (7.6%)	9 (7.3%)	df = 3
30–39	102	62 (26.3%)	40 (32.3%)	p = 0.60
40–49	169	112 (47.5%)	57 (46.0%)	
>50	62	44 (18.6%)	18 (14.5%)	
Duration of illness				$\chi^2 = 0.63$
1–5	316	208 (88.1%)	108 (87.1%)	df = 2
6–10	30	18 (7.6%)	12 (9.7%)	p = 0.73
11 and above	14	10 (4.2%)	4 (3.2%)	
Duration of treatment				$\chi^2 = 0.91$
<1	74	46 (19.5%)	28 (22.6%)	df = 3
1–5	242	162 (68.6%)	80 (64.5%)	p = 0.82
6–10	31	19 (8.1%)	12 (9.7%)	
>10	13	9 (3.8%)	4 (3.2%)	
Missed treatment				$\chi^2 = 1.89$
Yes	73	61 (16.9%)	12 (3.3%)	df = 3
No	287	171 (47.5%)	116 (32.2%)	p = 0.003
STIGMA				$\chi^2 = 2.13$
Yes	4	4 (1.7%)	0 (0.0%)	df = 1
No	356	232 (98.3%)	124 (100.0%)	p = 0.15

Table 1. Sociodemographic variables and psychiatric comorbidity among hypertensives.

More than one quarter of all the subjects, 241 (66.9%), were within low to average income range of less than 10,000–30,000 naira monthly. The majority, 169 (46.9%), had their onset of illness at the age range of 40–49 years. Persons who were married were significantly more likely to have a psychiatric comorbidity ($p < 0.001$). Also, those who reacted with either ‘very sad’ or a ‘wish to die’ when they received the diagnosis of the medical conditions were more likely to have psychiatric comorbidity ($p = 0.001$). See **Table 1**.

8.2. Pattern and prevalence of psychiatry morbidity in subjects with essential hypertension

A total of 232 (64.4%) subjects had associated psychiatric comorbidity, while 128 (35.5%) had no psychiatric diagnosis. Out of the total number with psychiatric comorbidity, 106 (29.4%) had a depressive illness, generalised anxiety disorder (GAD) was diagnosed in 58 (16.2%) patients, 32 (9.3%) patients had sexual dysfunction out of which 27 (7.5%) had male erectile dysfunction, while 5 (1.4%) had hyposexual dysfunction and was diagnosed all in females (see **Figure 1**).

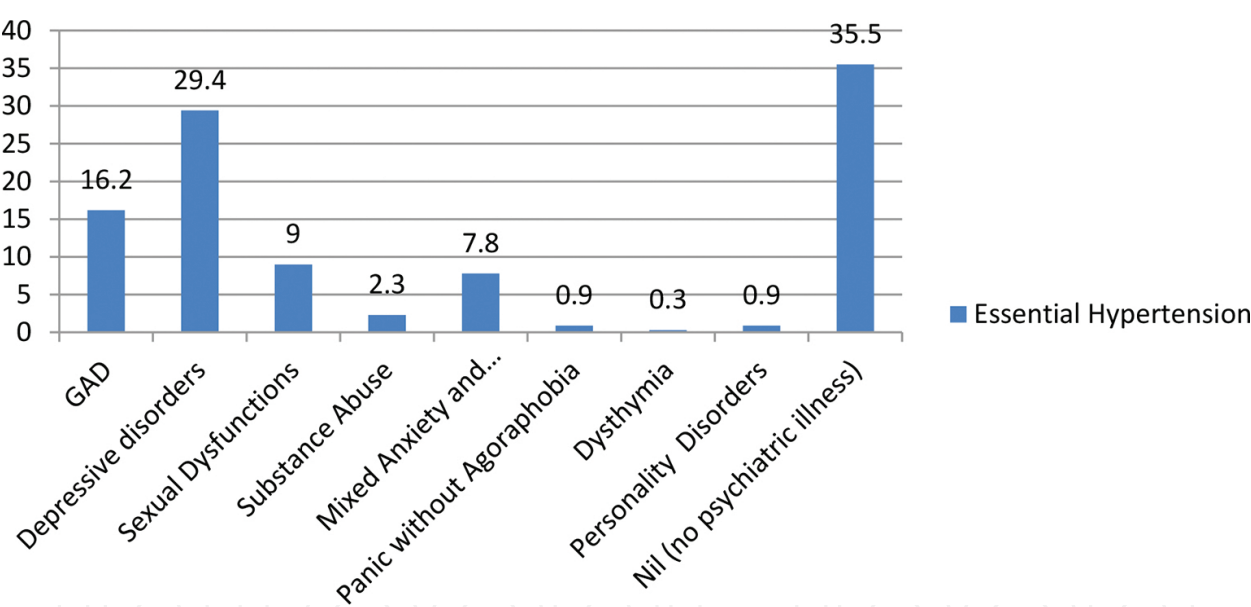


Figure 1. Bar chart showing the pattern and prevalence of psychiatric morbidity among persons with essential hypertension.

It is important to note that 20 (5.6%) patients were diagnosed with more than one condition. Erectile dysfunction and substance abuse were diagnosed in one patient; one respondent had GAD, substance abuse and erectile dysfunction; five respondents had GAD and hyposexual dysfunction; six had GAD and male erectile dysfunction, two had mixed anxiety and depression and male erectile dysfunction; and five had depressive illness and male erectile dysfunction. This accounted for the excess above 590 patients if the total diagnoses are summed up (see **Table 2**).

S/N	Diagnosis	Essential hypertension		
		Freq.	Male	Female
1	Substance abuse/male erectile dysfunction	1 (0.3%)	1 (1.7%)	0 (0.0%)
2	Generalise anxiety disorder/substance abuse/male erectile dysfunction	1 (0.3)	1 (1.7%)	0 (0.0%)
3	Generalised anxiety disorder	36 (10.0%)	17 (11.8%)	19 (8.8%)
4	Generalised anxiety disorder with somatic features	10 (2.8%)	4 (6.8%)	6 (2.8%)
5	Generalised anxiety disorder	5 (1.4%)	0 (0.0%)	5 (2.3%)
6	Generalised anxiety disorder/male erectile dysfunction	6 (1.7%)	6 (4.2%)	0 (0.0%)
7	Mixed anxiety and depression/male erectile dysfunction	2 (0.6%)	2 (3.4%)	0 (0.0%)
8	Moderate depression/male erectile dysfunction	4 (1.1%)	4 (6.8%)	0 (0.0%)
9	Mild depression/male erectile dysfunction	1 (0.3%)	1 (1.7%)	0 (0.0%)
10	Male erectile dysfunction	12 (3.3%)	12 (7.3%)	0 (0.0%)
11	Mild depressive disorders	35 (9.7%)	5 (3.5%)	30 (13.9%)
12	Dysthymia	1 (0.3%)	0 (0.0%)	1 (0.5%)
13	Mild depression with anxiety features	10 (2.8%)	2 (3.4%)	8 (3.7%)
14	Mild depression with somatic features	7 (1.9%)	1 (1.7%)	6 (2.8%)
15	Mixed anxiety and depressive disorders	21 (5.8%)	5 (3.5%)	16 (7.4%)
16	Moderate depressive disorders	36 (10.0%)	8 (3.6%)	28 (3.0%)
17	Panic disorder without agoraphobia	4 (1.1%)	2 (3.4%)	2 (1.0%)
18	Severe depression with psychotic features	8 (2.2%)	2 (3.4%)	6 (2.8%)
19	Personality disorders	5 (1.4%)	4 (6.8%)	1 (0.5%)
20	Substance abuse	6 (1.7%)	5 (3.5%)	1 (0.5%)
21	Nil (no diagnosis)	128 (35.5%)	57 (15.8%)	71 (19.7%)
	Total	360 (100%)	144 (39.5)	216 (32.9%)

Table 2. Pattern and prevalence of psychiatry morbidity in subjects with essential hypertension.

9. Association of psychiatric comorbidity with quality of life in persons with essential hypertension

From the study, psychiatric comorbidity was negatively statistically significantly associated with QOL in all domains except in General Health Facet in both medical conditions. Among the hypertensives patients, those with psychiatric comorbidity performed better on psychological and social domains (see **Table 3**).

Domains of QOL	Quality of life in persons with essential hypertension			
	Quality of life of all hypertensive patients	Psychiatric comorbidity	No psychiatric comorbidity	Statistical analysis
Physical domain	50.97 ± 14.671	45.98 ± 13.064	60.46 ± 12.788	t = -10.07 df = 358 p < 0.001
Psychological domain	54.20 ± 22.186	56.60 ± 24.914	61.05 ± 13.362	t = -4.35 df = 358 p < 0.001
Social domain	54.51 ± 26.13	48.06 ± 26.114	66.80 ± 21.378	t = - 6.87 df = 358 p < 0.001
Environment domain	50.01 ± 16.91	44.95 ± 14.831	59.62 ± 16.503	t = -8.57 df = 358 p < 0.001
General health facet	49.34 ± 22.44	47.98 ± 21.896	51.91 ± 23.319	t = -1.58 df = 358 p < 0.001

Table 3. Association of psychiatric morbidity with quality of life in persons with essential hypertension.

10. Discussion

The study on the psychiatric comorbidities associated with essential hypertension was conceptualised mainly from the observation of the relatively high frequency with which requests for psychiatric consultation were being received over time from other clinical departments in UPTH, particularly internal medicine. The observation was later confirmed by a study [43]. The study was, thus, started with the main objectives of determining the pattern and prevalence of psychiatric morbidity among persons with essential hypertension attending the outpatients clinic of UPTH. A cross-sectional design was adopted, with a sequential use of four study instruments, followed by analysis of data using the various statistical methods.

From the study, the prevalence of essential hypertension was noted to be increasing with age and was about twice higher, in the age groups 40–49 and 50 and above, compared to age group of 30–39, and about six times higher compared with age group 20–29. This result is consistent with earlier studies which reported that about 4.3 million Nigerians above the age of 15 years are classified as being hypertensive. Furthermore, the prevalence has been said to be related to age, particularly in females, with a substantial increase occurring after the age of 50 [36].

Though essential hypertension commonly starts in middle age, the illness may progressively become worse with attendant incapacitating symptoms that may infringe on the functional capacity of the individual and thereby lowering the quality of life. Africans usually seek medical attention mostly when illness has worsened with disabling symptoms, and in most cases late, in spite of awareness of the diagnosis. This is particularly more so for essential hypertension. Moreover, cultural factors, poverty and inaccessibility to healthcare facilities often contribute to this delay. This could also explain the over-representation of the older age group in the hypertensive patients in this study, who are more superstitious, poor and with

low-income capacity and hence unable to seek health care, particularly timely. Furthermore, essential hypertension is a chronic disease, and most of the respondents diagnosed over 5–10 years ago are still on maintenance antihypertensive therapy.

On the other hand, the rising prevalence of hypertension with age could be a reflection of exposure to enduring stressors, poor dietary habit, lack of exercise and other culturally permissible hazardous lifestyle [36].

The most prevalent age of onset of hypertension was ages 40–49, with 169 respondents or 46.9%. This was in agreement with other studies, which had established that the illness is commonest after 40 years. It is interesting to note that the number of patients steadily increased with increasing age of onset of illness with a sharp decrease after the age of 50. Hypertension beginning after the age of 50 years is most likely to be secondary hypertension [23]. This result is therefore in consonant with the methodology adopted in this study, where all those with any other concurrent medical illnesses were excluded in order not to introduce bias. However, it was difficult for most of the respondents to know exactly the age of onset of disease since majority only became aware of the diagnosis during their first or routine hospital visits.

Females predominated in the study with 60.8%, and although essential hypertension is more common in males, females may have been over-represented in this study due to two reasons. First, African females tend to have lower blood pressure than males early in life with a reversal of the trend after the ages 45–50 years [35, 36]. This may be due to hormonal changes associated with the preparation for or actual menopause occurring in this age group, coupled with the increasing family and domestic (stressors) responsibilities shouldered by married females in this age group. Interestingly, in this study, there was high prevalence of the married females in both groups. Another probable reason for the predominance of females in this study is that females are more willing and likely to volunteer their symptoms easier than males and consequently tend to have better health-seeking behaviours.

The married group was over-represented in the study (71.4%). This preponderance might be due to low rates of divorce and separation, which may reflect a dominance of Christianity in the study environment. Furthermore, widows constituted a significant percentage (15%) among the hypertensives, next to the married group. Widowhood, no doubt, hurts and often results in severe emotional trauma, particularly when it is sudden and early in life. More than half of the subjects who were single (10.6%) were above the age of 30 years, many of whom were unemployed. In Africa, due to sociocultural values, a female not yet married at the age of 30 years and above calls for concern not only to her but also to her family members. Majority of the separated group were females. Although lower rates of psychiatric comorbidities were found among these categories, both separation and divorce are capable of impacting enormous psychological trauma in affected individuals.

Also from the study, it was found that more of each of the categories—married, separated and widowed—had more psychiatric comorbidity among patients with hypertension. A possible explanation could be that in hypertension, marital difficulties, separation and even widowhood may serve as baseline psychosocial factors that may act either singly or in synergy with the medical stressor (hypertension) to cause psychiatric comorbidity. The presence of these

psychosocial stressors alone can equally predispose to hypertension. Thus, in hypertension, psychological stressors are both causal and effectual.

Most of the subjects in this study had attained various levels of formal education especially secondary and tertiary. Perhaps the influence of westernisation and urbanisation in Rivers State, Niger Delta and Nigeria might have played an important role. Furthermore, the cosmopolitan nature of Port Harcourt, domiciling majority of ethnic groups in Nigeria, with over 50% of Nigeria's oil and gas business, makes education a priority. A good number (39%) of the subjects with hypertension had tertiary education. The fact that they were educated may have increased their chances of employment and possibly ability to seek quality health care and timely, too. It is equally important to note that perhaps the older one becomes, and probably with more education, the more his or her socioeconomic and family responsibilities, with their accompanying stressors.

A number of studies have implicated environmental stressors as important aetiological factors in high blood pressure, particularly in already genetically predisposed individuals [82]. Occupational environments in Nigeria had remained stressful due to lack of job security and poor wages and remunerations, confronting countless demands from members of the family in a poverty-ravaged economy such as ours. This is supported by the fact that the percentage of females with tertiary education was significantly less compared to other educational levels. The incidence of psychiatric comorbidity was lowest among those with tertiary education. Hence, education tended to have some protective influence on the psyche of the study subjects. Expectedly, those with higher level of education were more likely to secure better employment, earn better income and have better access to quality health care. Thus, in this study, results showed that being employed correlated positively, while unemployment correlated negatively with occurrence of psychiatric comorbidity.

From the study, essential hypertension was associated more with low income. Stable income, no doubt, is an important stabilising factor for any chronic illness. In this study, income level negatively correlated with psychiatric comorbidity in hypertension. The higher the income level, the lower the prevalence of psychiatric illness in hypertension. Among the hypertensives, there was preponderance of older adults; however, as it has to do with income level, it appears to be a combined effect of both income and age in the study.

African extended family may also be contributory. Sharing the burden of disease by relatives in the African extended family system may be an advantage to the outcome of chronic illnesses like hypertension, as it tends to distribute responsibility from such patients to other family members. This was evident from this study where 85% of hypertensives live with their supportive family members. Adequate social support has been identified as a key factor in relieving or decreasing psychosocial burden associated with chronic medical conditions.

Expectedly, the longer the duration of these illnesses, the more likelihood of developing psychopathology. Interestingly, however, the reverse was observed in this study, as psychiatric comorbidity steadily decreased with increasing duration of illness. This might suggest that with the passage of time, one tended to absorb the initial shock of diagnosis and had adequately readjusted to the medical condition. Secondly, they might have stabilised on

medications. The high rate of psychiatric illnesses among those in treatment between 1 and 5 years could probably reflect an over-representation of subjects in this category *ab initio*. Also, the effect of advancing age might have played a role as many would have died from complications of the illness. This was reflected in this study as subjects in the category of duration of treatment greater than 10 years were fewer. Mortality rates in this medical condition have remained high [93].

The reduced rate of psychiatric comorbidity among the category that has had treatment for 6 years and above could suggest that most of the medications being used in these clinics in the treatment of patients with essential hypertension even though they potentially may be associated with neuropsychiatric side effects [82] were cautiously used and properly monitored. This might have resulted into minimal rate of psychiatric side effects even with prolonged use.

From the results of this present study, the prevalence of psychiatric morbidity in the hypertensives was 64.4%. This was slightly higher than results from previous studies [62]. Ohene, in his study in Benin City, found a prevalence of 35% psychiatric morbidity among persons with essential hypertension [62]. Although these results seem to be far apart, the difference might reflect the increasing environmental stressors and economic hardship, increasing spate of insecurity in Nigeria and particularly in the Niger Delta, which has significantly worsened over the last 10 years.

Hypertension alone can present with psychiatric morbidity, and this may be aggravated by adverse environmental factors. Adverse environmental factors can in turn predispose to essential hypertension and mental illness. Indeed, this relationship describes a sustained vicious circle. Another possible reason for the observed difference was that in the study by Ohene [62], GHQ-30 was used which is a less-sensitive version when compared with GHQ-12 (used in this study). Thirdly, the sample size was smaller, i.e. 40 patients compared with 360 hypertensives used in this study. The higher the sample size, the higher the likelihood of diagnosis of psychiatric morbidity. Furthermore, several studies have suggested that hospital-based treatment of hypertensives tends to be associated with higher neuroticism and levels of psychiatric morbidity than their counterparts on community-based treatment. Another plausible reason could be the use of some antihypertensive particularly calcium channel blockers and α -methyldopa, implicated recently in psychiatry comorbidity among patients on treatment for hypertension.

Out of the total number with psychiatric illness, 232 (64.4%), depression was significantly the commonest with 29.4% as against 16% in Ohene's study [62]. Depression was mostly the mild and moderate types with few cases presenting with psychotic features which were mostly mood congruent. This might also be due to reasons earlier given for overall psychiatric disorders. Hypertension presents with very disabling symptoms, which could impair the functional capability of the sufferer. This, coupled with other adverse depressogenic environmental factors, might predispose the patient to depressive illness. There was significant predominance of females with depression. This finding, which is consistent with the gender distribution of depression, may equally reflect the willingness of the female gender to volunteer information on their health, hence, better health-seeking behaviour. Hypertensive

disease, which carries the risk of both physical and emotional burden, is likely to affect the mood-regulating centre of the brain, i.e. the limbic system.

The prevalence of generalised anxiety disorder was 16.1% in this study. Previous study had found 12%. This could possibly be more frequent. The effect of propranolol and benzodiazepines (bromazepam and diazepam), which are commonly used medications in the General Outpatient Department, may have been responsible for the relatively low prevalence. Males were 48.2% and females 51.8%. Again, the observed gender bias is in line with existing literature. Earlier studies have suggested that hypertensives were more neurotic, more insecure, more conservative and more tense.

Hypertension and generalised anxiety disorder are somewhat similar illnesses, sharing common pathway—the sympathetic pathway. It is for this reason that medications like beta blockers such as propranolol and some benzodiazepine that act by dampening the activity of the sympathetic pathway have comparable usefulness in both disease conditions. Another reason to ‘drive home’ the relationship between hypertension and anxiety is that fundamental advances in the understanding of hypertension have coincided with the theories of anxiety states and affective disorders, suggesting catecholamines—particularly known here is noradrenaline [11].

This finds common ground in suggested mechanism for producing increased arterial pressure and neurotic states [11]. This is also consistent with the study by Kidson [94], who argued that higher neurotic scores of his hypertensive outpatients were due to a ‘reactive state’ occurring in them contrary to other study [113], which reported the absence of neuroticism among newly hypertensives and suggested that drug treatment could cause the observed neurosis. However, in this study, the inclusion criteria of 1 year duration of illness stand to disprove this, and it also appears that most of the hypertensives with diagnosis of anxiety were not due to their medication, and most were having one psychosocial stressor or the other that may either be responsible for or worsen the hypertension, anxiety or even both.

Panic disorder was diagnosed in 1.1% of hypertensive patients in this study. Many workers have consistently established that most of the major deleterious effects of high blood pressure are in the heart, blood vessels, kidneys and brain [11]. Therefore, with the strong connection between the heart and cardiovascular system, hypertension and the psyche, diagnosis of panic disorder in hypertensive subjects might not be a surprising finding. In fact, other names that have been given to anxiety neurosis (now obsolete) include cardiac neurosis, irritable heart syndrome, soldier’s heart, nervous tachycardia, vasomotor neurosis, vasoregulatory asthenia and disordered action of heart, among others. Strikingly, these names mainly further imply the close and strong association between the heart or cardiovascular system and anxiety states.

Considering the fact that psychiatric morbidity was most prevalent in the unemployed, elementary and low-income workers, separated and divorced, all baseline psychosocial factors, capable of causing depressive illness, anxiety disorders and other mental illnesses, hypertension is commonly associated with stressful conditions. This is in line with findings from other studies which also showed that some common aetiological factors like stress-related situations, issues of job loss and unemployment, prolonged difficulties and people at war front

were shown to have hypertension and anxiety [100]. It has been found that stress, which potentially causes anxiety, also increases the level of cortisol which in turn causes increased deposition of arteriosclerotic deposits in the intima of blood vessels [11]. These deposits gradually narrow the lumen of the vessels. This in turn increases arterial pressure resulting in hypertension [11].

Sexual dysfunction was diagnosed in 9.0% of hypertensive patients. Of this, 84% had male erectile dysfunction, while 16% who were all females had hyposexual dysfunction. Hyposexual desire disorder (HSDD) is sexual dysfunction with decreased libido, lack of sexual motivation and decreased sexual fantasies. Some studies have found associations between hypertension and erectile dysfunction in men, while others have implicated effects of some antihypertensive drugs like methyldopa and reserpine [50, 62], in addition to psychogenic impotence. However, in this study no patient was being treated with reserpine, and of the 27 males with erectile dysfunction, only negligible three subjects were on methyldopa.

Another diagnosis that was made among eight of the hypertensives was substance abuse. More than 80% of them had alcohol-related disorder with the male-to-female ratio of 7:1. Although the gender gap was wide, substance abuse generally is commoner among males than females. There is a bidirectional relationship between substance abuse and hypertension, i.e. substance abuse particularly alcohol can cause hypertension while hypertension, on the other hand, can precipitate substance abuse due to frustration [70, 71]. People with hypertension tend to abuse substance mainly to self-medicate their depression or to abate the many anxiety or anxiety-like symptoms that characterised hypertension, hence the use of propranolol and diazepam which have anxiolytic effects.

Personality disorder was seen in 5% of the hypertensive subjects. The concept of type A behaviour pattern (TABP), also referred to as type A personality, which appears fairly well established as a strong correlate of coronary heart disease (CHD), strongly supports a relationship between hypertension and personality disorder [93]. High blood pressure (HBP) is identified as major risk factor to CHD, which is reported to be on the increase in Nigeria. However, the present study found a low rate of personality disorder.

Hypertensive subjects with more than one psychiatric morbidity were seen in this study. Twelve percent had both GAD and sexual dysfunction, while 8% had both major depression and sexual dysfunction. This equally agrees with the multifactorial aetiological basis of essential hypertensive with environmental stressors playing as much significant role as genetic factors.

For quality of life among patients with hypertension, studies in western countries have shown inconsistent findings. There are no local studies to compare with the present study where both psychiatric comorbidity and QOL were studied together. However, a study that compared QOL of epileptics, schizophrenics and hypertensives found that the last fared poorly on all domains except on overall quality of life where they all fared equally. Some authors have opined that quality of life will be poor in the developing countries like Nigeria where factors of finances, social relationships, health and personal safety are considered to be poor. Hypertension in adults has a high impact on the economy and with consequent low quality of life of

individuals. The results in this study are consistent with many studies elsewhere [27]. It also agrees with a population-based study, which found a lower health status in the hypertensives compared with individuals free from hypertension. This finding varied a little from previous studies where all domains of QOL except domain 4 (environment) and health satisfaction were affected by psychiatric comorbidity.

11. Conclusion/recommendations

The findings of this study support the impression that essential hypertension is a chronic debilitating illness, associated with psychiatric comorbidity. In both groups, being divorced was associated with lower QOL in some domains. The results support the call that the management of patients with hypertension should include attention to their mental health status and subjective quality of life in order to enhance the quality of care.

Author details

Aborlo Kennedy Nkporbu* and Princewill Chukwuemeka Stanley

*Address all correspondence to: nakpigi2008@yahoo.com

Department of Neuropsychiatry, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

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